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EFFECTS OF SELF-DIRECTED LEARNING ON GIFTED ELEMENTARY SCHOOL CHILDREN.

BY- GOLD, MARVIN J.
SYRACUSE UNIV., N.Y., RESEARCH INSTITUTE

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GIFTED SCHOOL CHILDREN WORKED FOR A PERIOD OF SEVERAL MONTHS IN SELF-DIRECTED LEARNING SITUATIONS IN A RESOURCE ROOM WITHOUT TEACHER-IMPOSED DIRECTION. THEY HAD OPPORTUNITIES TO EXPLORE AREAS OF INTEREST (DURING TWO CLASS PERIODS PER DAY) IN READING, SOCIAL STUDIES, AND SCIENCE IN THE MANNER AND DEPTH WHICH THEY CHOSE. PRE- AND POST-TESTS WERE ADMINISTERED TO MEASURE STUDENT GROWTH IN ACADEMIC ACHIEVEMENT, STUDY SKILLS, DIVERGENT THINKING, AND PERSONAL AND SOCIAL ADJUSTMENT. TEST RESULTS WERE COMPARED WITH THOSE OF A RANDOM CONTROL SAMPLE WHICH HAD NO CONTACT WITH SELF-DIRECTED LEARNING. OTHER INFORMATION WAS GATHERED THROUGH DAILY LOSS MAINTAINED BY RESOURCE ROOM PERSONNEL. BOTH THE EXPERIMENTAL GROUP AND THE CONTROL GROUP WERE CHOSEN FROM FOURTH-, FIFTH-, AND SIXTH-GRADE CLASSROOMS AND WERE CONSIDERED TO BE MODERATELY SUPERIOR ON VARICUS INTELLECTUAL MEASURES. LITTLE DIFFERENCE WAS NOTED BETWEEN THE TWO GROUPS ON GAINS MADE IN ACADEMIC ACHIEVEMENT, STUDY SKILLS, AND DIVERGENT THINKING ABILITY. PERSONAL AND SOCIAL ADJUSTMENT APPEARED TO BE FAVORABLY AFFECTED WHEN SELF-DIRECTION WAS USED. (JH)

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EFFECTS OF SELF-DIRECTED LEARNING ON GIFTED ELEMENTARY SCHOOL CHILDREN

Marvin J. Gold, Ph. D.
Project Director
Syracuse University

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PREFACE

Education has historically considered itself the designer, the transmitter, and the consumer of curricular and methodological changes. It is conceivable that today with such a vast explosion of knowledge occurring, education should no longer assume such an all encompassing obligation. Since curriculum is logically dependent on content that is available, appropriate, and up-to-date, it is reasonable to assume that the individuals who design curriculum should be those whose understanding of content comes from an intimate relationship with that content, e.g., the historian, the scientist, the artist, or the mathematician. Educators and educational psychologists might more appropriately concern themselves with methodological revisions only.

If this proposition has some semblance of truth for the general school population, it certainly has a great deal of truth for the intellectually gifted population. A limited content has usually led to a stifling curriculum for the gifted child. When that limited content, however, is coupled with a restrictive methodological approach, the resultant impasse can be most devastating. Hopefully the present investigation will offer some insights into approaches that have usually heretofore been ignored.

The present study certainly cannot be looked upon as anything but a rudimentary pilot investigation which at best would give insight into directions for future studies. The investigator, however, is certain that many of the necessary guideposts are present and what will be essential in the future is the presence of individuals - including the writer - who can properly read the signs.

MJG

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The investigator is most appreciative of the assistance given to him by the many individuals who volunteered their time and effort in order to work on a project much larger than originally proposed.

To mention any names would be to slight some, therefore, to all members of the investigator's classes, to his graduate assistant, as well as to those cooperative school personnel, many thanks must be offered.

The aid given also by the Syracuse University Computing Center is also acknowledged with many thanks.[1]

Finally, the investigator wishes to thank individuals whose opposing viewpoints caused him no end of problems. But it is only through those opponents of the problem that he more fully realized the importance of the necessity of further investigations. To all then-- those who helped and those who have tried to hinder -- many thanks.

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INTRODUCTION

Although such platitudes as "meeting the needs of individual children" are to be found in abundance in the literature, actual classroom operation very often ignores the fact that there are individual differences; gifted students in the past have quite often received the short end of the educational stick. The reasons for this are undoubtedly varied and complex. It is conceivable that some classroom teachers find it impractical to work with gifted children since they can be quite dissimilar from the majority of the pupils as well as dissimilar from each other. It is likewise possible that teachers' goals for these students are unrealistic in that the pupils are not receiving challenges commensurate with their often unique abilities. Some teachers are unaware of the fact that many of these children are able to thrive in a learning situation when they are allowed to work independently. Others sometimes feel threatened by children who have the ability to achieve and grow without teacher-imposed direction.

If many of the cues for classroom operation were put in the hands of gifted learners rather than their teachers, individualized learning could conceivably be more powerful and more meaningful than individualized instruction. It would be reasonable to expect that growth not only would take place in the several academic subjects, but also in the areas of study skills, divergent thinking ability, and personal and social adjustment.

Purpose of the Study

This study is an attempt to investigate the effects of self-directed learning on gifted elementary school children who worked without teacher-imposed direction in a resource room. An assessment was made into the nature

and degree of the Ss' growth in the academic areas of reading, social studies, and science as well as their growth in divergent thinking ability and personal and social adjustment.

Although the experimental Ss were not directly concerned with other areas such as arithmetic, language arts, or study skills in the resource room, their level of achievement in these areas was also assessed.

By placing a group of gifted intermediate level elementary school children in a resource room for a period of time each day, and by permitting these children to direct their own activities, it was assumed that it would be possible to determine the feasibility of self-direction as a program stimulus.

If superior children were allowed to determine the activities in which they engaged and were then to prove themselves significantly more successful in academic and non-academic areas, it certainly would seem appropriate to consider the inclusion in elementary schools of resource rooms wherein gifted children could set and meet goals that would be more realistic for them in the light of their own development.

BACKGROUND

A thorough investigation of the literature has failed to produce any experimental evidence that would lend support to or refute the purposes of the present study. Although Lewin, Lippitt, and White (1939) in their classic study might at first seem to present a somewhat negative picture of child-directed activities, an analysis of their study indicates that there are a few basic differences. Primarily, their study dealt with an older group of children. Secondly, these children were placed in a non-academic (club) situation. And finally, it should be noted that their laissez-faire group was not guided by any basic "ground rules" as was the case in the present study.

Descriptions of characteristics of gifted children to be found in the literature include such attributes as intellectual curiosity, independence, ability to concentrate, and ability to generalize (Abraham, 1958; DeHaan & Havighurst, 1957). It is logical to assume that children possessing characteristics such as these would meet with success when learning in a self-directed situation.

Although there might be a dearth of experimental evidence, there is an abundance of theoretical material that gives credence to the present study. Rogers discusses the importance of self-discovered, self-appropriated learning. He states that when one individual tries to communicate ideas and experiences to another "it becomes teaching and its results are inconsequential" (Rogers, 1961, p. 276).

Combs and Snygg (1959) view learning as an active process also. They say that it takes place because the individual is striving to satisfy his own needs. Previously Cantor had said, "An active pupil with ongoing, vital interests wants to explore and investigate" (1953, p. 289). In another source, he indicates that although practical goals might not be reached immediately, the ultimate benefits afforded by freedom to learn are much more significant (Cantor, 1946).

Whether self-directed learning is most effective because the individual knows "better than anyone else what is good for him" (Maslow, 1962, p. 39) or because "the growing self must feel...it is helping shape its own destiny..." (Kelley, 1962, p. 17) or because the child has a "chance to be alone, to get acquainted with (himself), to engage in self-communion" (Gallagher, 1963, p. 15) is not as important as the proposition that positive and dynamic gains are envisioned for pupils engaged in self-directed activities.

None of the above authorities, of course, advocates the abolition of teaching, but rather each of them implicitly (if not explicitly) envisions a reappraisal of the teacher's role. Gallagher sees the teacher "freed from mere lecturing in the classroom, and enabled to be rather a guide and consultant" (1963, p. 16). This new type teacher, according to Rogers, would inform pupils that he might be used as a resource person (1961). Ultimately the teacher should see "his role as that of a helper rather than a director. His function is to help the learner identify problems, develop interests, satisfy curiosities and seek solutions to problems" (Combs, 1962, p. 150). Flack and Anderson put it quite succinctly when they say, "There is ultimately only one expert on how to teach and that is the learner" (1964, p. 10).

In order to implement a program of self-directed activities, it is necessary that the learning situation reflect the philosophy of the program. Combs states, "Self selection in an environment rich in materials, where students sense how they feel and what they think are important, can be extremely effective in helping students to become more fully functioning" (1962, p. 202).

HYPOTHESES

The present study attempted to test the following hypotheses:

Hypothesis I: The self-directed Ss will have a level of achievement greater than that of the control groups in the areas of reading, social studies, and science.

Hypothesis II: The self-directed Ss will have an achievement level greater than that of the controls in certain peripheral areas such as language arts and work-study skills.

Hypothesis III: The self-directed Ss will have significantly greater growth in the area of divergent thinking as evidenced by increased flexibility, fluency, and originality.

Hypothesis IV: The self-directed Ss will have a level of growth in personal and social adjustment equal to or greater than that of the control group.

METHOD

Subjects

An elementary school serving an upper middle class community which was located in an upstate New York city provided the pool of students from which the Ss were drawn.

Parents of all intermediate level children (grades 4, 5, 6) in attendance at the school were contacted prior to the opening of school in September, 1964. The experimental program was described and an opportunity was given to the parents to withdraw their children from consideration for inclusion in the study. Although several parents inquired, they were told that they had no opportunity to determine whether their children would be members of an experimental (E) group or a control (C) group. Approximately 5 per cent of the parents withdrew their children's names from further consideration.

The principal of the school and the children's previous year's teachers inspected the remaining names and eliminated any that they determined to have problems of great enough magnitude to cause the children difficulty in the new situation.

From an original pool of approximately 200 children, about 175 were left to investigate further. An inspection was made of the remaining students'

permanent records. Group IQ scores were perused carefully. The 32 children with the highest IQ scores--regardless of the instrument originally employed to assess the children's intelligence--were selected for each grade. The children were then randomly assigned to E and C groups. Table 1 includes a description of all Ss who remained until the conclusion of the program and who were administered all pre- and post-tests.

Table 1

Description of Subjects

Group	Sex M	Sex F	Initial C.A. (in months) $\bar{X}$	Initial C.A. (in months) SD	California Short-form Test of Mental Maturity: Language IQ $\bar{X}$	Language IQ SD	Non-language IQ $\bar{X}$	Non-language IQ SD	Total IQ $\bar{X}$	Total IQ SD
4E	6	7	110.7	3.9	115.6	11.4	123.4	6.3	121.9	7.4
4C	4	11	109.7	5.3	119.5	12.2	120.6	7.2	121.9	8.8
5E	11	5	120.2	5.5	127.2	8.3	128.9	8.3	130.4	8.0
5C	9	7	125.4	3.2	123.5	10.0	128.4	10.7	127.1	8.9
6E	5	5	134.0	2.4	122.6	7.4	127.6	6.8	126.7	6.4
6C	7	9	135.4	5.8	123.9	6.7	126.1	5.4	126.8	5.8
Total E	22	17	120.6	9.9	122.2	10.5	126.7	7.7	126.6	8.3
Total C	20	27	123.8	11.6	122.4	10.0	125.2	8.7	125.4	8.3

Instruments

A pre-test and two post-test administrations of several group devices were originally planned. Since this study was terminated prior to the final testing, only the first series of post-tests were administered. Wherever possible, alternate forms of the same instrument were used to measure change over time for all Ss. The pre-test took place in September; the post-test, the following February.

The tests employed to measure academic achievement were (1) Level 4 of the Sequential Tests of Educational Progress (Cooperative Test Division, 1959), (2) the elementary level of the California Achievement Tests (Tiegs & Clark, 1957), and (3) the elementary level of the California Tests in Social and Related Sciences (Adams & Sexson, 1953).

The instrument employed to measure study skills was the intermediate II level of the Stanford Achievement Test: Soc. Studies (Kelley, Madden, Gardner, & Rudman, 1964).

The instrument used to measure aspects of divergent thinking was the Minnesota Tests of Creative Thinking: Abbreviated Form VII (Bureau of Educational Research, 1962).

Personal and social adjustment were measured by administering the SRA Junior Inventory (Remmers & Bauerenfeind, 1957) and the elementary level of the California Test of Personality (Thorpe, Clark, & Tiegs, 1953).

Since the Ss were admitted into the program on the basis of various IQ tests, it was decided that a single instrument would give a more meaningful picture of the intellectual ability of the group. Although it was originally planned that the Stanford-Binet would be administered to all Ss, the investigator altered this approach and used a group instrument instead. The short form of the California Test of Mental Maturity (Sullivan, Clark, & Tiegs, 1963) was the instrument employed. Table 1 includes the obtained IQ scores.

Aside from the above, other devices were used to obtain information. These include questionnaires completed by the children and their parents, evaluations by personnel working with the children, and daily logs maintained by the resource room personnel. Appendix A contains the questionnaire forms. Appendix B includes examples from the log material.

Procedure

The present study was designed to investigate the differences found between self-directed groups of gifted elementary school children and groups of gifted children in regular classroom situations. All groups of pupils worked together in all areas except reading, social studies, and science. For these areas, the controls remained with their regular teachers while the experimental Ss worked independently in a resource room. Members of the experimental groups had opportunity to explore areas of interest to them in the manner and to the depth they chose. Although their activities were self-directed, they had opportunity to call upon resource persons to aid them. Whereas the regular classroom teachers were qualified and certificated individuals, the resource persons were non-professionals. For the most part, they had college training in liberal arts with a minimal amount of training in formal education courses. Although several resource persons were used, only one was in attendance at a time. By using several it was expected that personality and experiential backgrounds would be vitiated.

Each resource person was instructed to refrain from initiating activities or imposing direction upon the experimental Ss. However, each was expected to help the children establish and maintain patterns of behavior necessary for the most efficient and cooperative use of the resource room. For example, children in the resource room were allowed to work independently or as members of groups. They were encouraged to interact or not as they saw fit. If a particular child wanted to make an oral report to several members of the class, all other individuals were to remain silent while the report was being presented. The child giving the report, however, was told that the group would only have to be quiet for a five to ten minute period and that the report should be limited to a maximum of ten minutes.

The resource room housed a wide variety of books and materials. The materials were chosen to include items representing difficulty levels extending from grades one through twelve. Reference books, maps, globes, film strip viewers and film strips were placed in the room. Also available were a lab table and equipment for experimentation. Appendix C includes a list of materials.

Aside from the books and equipment found in the resource room, the experimental Ss were encouraged to interact with each other as well as the resource person in gaining the skills and competencies they believed to be essential.

The three groups of experimental Ss came into the resource room twice daily. Each E group worked independently. The daily schedule is presented in Table 2.

Table 2

Daily Schedule of Experimental Groups in Resource Room

Grade	Period in Resource Room	Length of Session
4	8:40 AM - 9:30 AM	50 minutes
5	9:35 AM - 10:25 AM	50 minutes
6	10:30 AM - 11:20 AM	50 minutes
4	12:45 PM - 1:25 PM	40 minutes
6	1:30 PM - 2:10 PM	40 minutes
5	2:15 PM - 2:55 PM	40 minutes

Results and Discussion

The purpose of the present study was to investigate the effects of self-directed learning on intermediate level gifted school children. It was determined that the academic areas in which the experimental Ss would receive instruction from the regular teachers would be reading, social studies, and science. The experimental Ss left their regular classrooms whenever the teacher started formal instruction for the controls in any of the above mentioned areas. Schedules were coordinated so that there were definite periods during which teachers of the control groups gave instruction in the three areas.

Since there were many unexpected problems that arose during the present investigation, it is essential that the reader understand the statistical results in the light of the research situation.

Within approximately one month of the program's initiation, it was brought to the principle investigator's attention that several of the parents of children in the E groups were encouraging their children to complete the reading, social studies, and science assignments intended for the control Ss. The investigator took this information to the school and asked that a special meeting be called. All parents were notified of the meeting. The investigator discussed what apparently was a misunderstanding on the part of some of the parents. He indicated that this was leading to a deterioration of the intent of the program. He discussed the program again, explaining that the purpose was not to "enrich" the regular activities but to substitute a different methodological approach for that which was employed in the regular classrooms. The investigator then told the parents that they could withdraw their children

from the experimental program if they could not tolerate the intent of the research. The parents were given a few days to consider this and to notify the investigator if they wanted their children removed from the resource room situation. From an original N of 16 in the fourth grade experimental group, 13 remained in the program; all E children remained in the fifth grade group; and, 10 out of 16 remained in the sixth grade group. The total experimental group was thus reduced from an original N of 48 to a new total N of 39. The test data of all Ss who left the E group were not included in any of the analyses.

A deterioration was evident shortly after this time in the relationships between the elementary school personnel and the investigator, although no such deterioration occurred between the city school authorities and the investigator. Apparently, among other things, the control teachers took the meeting as an affront since on a few occasions the children were encouraged to do both sets of work. The investigator has no reason to believe that after the called meeting there was any similar activity on the part of the control teachers or parents that could be considered detrimental.

At the original meeting in September it was announced that there would be another meeting during which the first post-test results would be reported to the parents. This meeting was planned for February. The investigator was led to believe by the principal that several of the parents were considering withdrawing their children from the program at the time. He requested that the principal support him in indicating to the parents that the children were not being harmed academically and that the program should continue to receive their support. This support was denied.

The original design called for two post-testing sessions--one at mid-year and one at the conclusion of the academic year. It was expected that some Hawthorne effect would be present and for that reason the February to June results might be more meaningful than the September to February results. Nevertheless, the investigator decided that the possible Hawthorne effect would be easier to handle than trying to interpret information gathered from a reduced and biased sample. Therefore, it was the considered opinion of the investigator that the program should be terminated earlier than originally planned.

It is for this reason, also, that all results should be interpreted in light of (1) the friction that existed from the outset and (2) the possible bias afforded by a Hawthorne effect.

Hypothesis I: The self-directed Ss will have a level of achievement greater than that of the control groups in the areas of reading, social studies, and science. (Rejected)

A series of t tests were run to determine if there were significant statistical differences between the September to February changes made by the experimental and control groups in the areas of reading, social studies, and science.

No significant statistical differences between the experimental and control groups were to be found on any of the reading measures. The California Achievement Test and the [redacted] Reading Test were used to check on quantitative differences over time. As can be seen in Table 3, the California Reading Vocabulary mean changes were in favor of the experimental Ss. None of these differences, however, were statistically significant. There is no clear cut picture as to differences on Reading Comprehension. Total Reading likewise does not indicate any clear cut gain in favor of

Table 3

Group Changes in Reading Achievement as Evidenced by Differences in Mean Gain Scores on the California Achievement Test and the Sequential Tests of Educational Progress

Variable	Group	N	Group	N	$\bar{X}$ Change Over Time E	C	t
CAT Reading Vocabulary	Total E	39	Total C	47	2.72	1.98	.69
	4E	13	4C	15	4.69	4.40	.11
	5E	16	5C	16	1.75	1.12	.43
	6E	10	6C	16	1.70	.56	1.37
CAT Reading Comprehension	Total E	39	Total C	47	4.21	3.74	.28
	4E	13	4C	15	5.54	7.33	.50
	5E	16	5C	16	4.56	1.25	1.41
	6E	10	6C	16	1.90	2.88	.45
CAT Total Reading	Total E	39	Total C	47	6.92	5.68	.60
	4E	13	4C	15	10.23	11.73	.33
	5E	16	5C	16	6.31	2.38	1.30
	6E	10	6C	16	3.60	3.31	.13
STEP Reading	Total E	38	Total C	47	14.00	13.34	.20
	4E	12	4C	15	7.67	6.00	.32
	5E	16	5C	16	21.62	20.06	.27
	6E	10	6C	16	9.40	13.50	.93

one group over the other. The STEP Reading Test which purports to assess the "ability to reproduce ideas,...(the) ability to translate ideas and make inferences,...(the) ability to analyze motivations,...(the) ability to analyze

presentation,...(and the) ability to criticize" (Cooperative Test Division, 1957a,p.9) was also unable to point up any definite trends in favor of one group over the other.

In the social studies tests employed (the California Test in Social and Related Sciences and the STEP Social Studies) there was only one instance in which one group's gains were significantly superior to the gains made by another group. This was in the subtest entitled American Heritage in which the fifth grade C group obtained mean gain scores significantly superior to the mean gain scores obtained by the fifth grade E group ($p<.05$). Table 4 includes the social studies results.

It of course should be considered that the one score that was statistically significant at the .05 level might have happened by chance alone, since there were twenty t tests employed to investigate group changes in social studies achievement. However, comments from several of the parents of the fifth grade C group lead the investigator to believe that the amount of extra work given to the fifth grade C children in social studies would indeed be the cause of this difference in favor of that group.

Table 5 contains the group changes in science achievement over time for all E and C groups. Here also there is only one instance in which a significant t was obtained. The STEP Science gain score for the fourth grade Es was significantly superior to the score obtained by the fourth grade Cs. Considering both the other fourth grade scores in Table 5, as well as the picture of activities by fourth grade students in the resource room as presented in the daily logs, it is reasonable to expect that the difference is a real one.

Table 4

Group Changes in Social Studies Achievement

As Evidenced by Differences in Mean Gain Scores

on the California Tests in Social and Related Sciences

and the Sequential Tests of Educational Progress

Variable	Group	N	Group	N	$\bar{X}$ Change Over Time		t
CTSRS American Heritage	Total E	39	Total C	47	7.33	9.77	.94
	4E	13	4C	15	11.00	15.73	.96
	5E	16	5C	16	9.31	15.31	1.83*
	6E	10	6C	16	-.60	-1.38	.27
CTSRS Peoples of Other Lands and Times	Total E	39	Total C	47	2.03	2.74	.54
	4E	13	4C	15	.77	2.47	.66
	5E	16	5C	16	1.56	1.25	.16
	6E	10	6C	16	4.40	4.50	.04
CTSRS Geography	Total E	39	Total C	47	3.44	8.47	1.56
	4E	13	4C	15	9.92	18.07	1.15
	5E	16	5C	16	3.06	7.50	1.02
	6E	10	6C	16	-4.40	.44	1.54
CTSRS Basic Social Processes	Total E	39	Total C	47	5.74	7.30	.86
	4E	13	4C	15	7.46	10.47	.81
	5E	16	5C	16	4.31	5.75	.43
	6E	10	6C	16	5.80	5.88	.05
STEP Social Studies	Total E	38	Total C	47	9.50	10.15	.33
	4E	12	4C	15	8.58	11.33	.70
	5E	16	5C	16	10.50	12.88	.71
	6E	10	6C	16	9.00	6.31	1.03

* Significant at the .05 level.

Table 5

Group Changes in Science Achievement as Evidenced by Differences in Mean Gain Scores on the California Tests in Social and Related Sciences and the Sequential Tests of Educational Progress

Variable	Group	N	Group	N	$\bar{X}$ Change Over Time E	C	t
CTSRS Elementary Science	Total E	39	Total C	47	.33	-.19	.34
	4E	13	4C	15	2.54	-.93	.95
	5E	16	5C	16	-.56	-.38	.08
	6E	10	6C	16	-1.10	.69	1.00
CTSRS Health and Safety	Total E	39	Total C	47	-1.13	-1.70	.36
	4E	13	4C	15	2.15	.20	.56
	5E	16	5C	16	-3.75	-3.56	.07
	6E	10	6C	16	-1.20	-1.62	.28
STEP Science	Total E	38	Total C	47	8.55	5.36	1.28
	4E	12	4C	15	12.92	3.07	2.01*
	5E	16	5C	16	7.38	7.69	.08
	6E	10	6C	16	5.20	5.19	.00

* Significant at the .05 level.

Not only was the present investigation interested in growth in reading, social studies and science, but also in seeing what changes would take place in certain other areas such as language arts, mathematics, and study skills.

Since both Cs and Es received instruction in these other subjects at the same time from the same teacher, it was assumed that any differences occurring in these other areas would reflect the differences that existed between the resource room and the regular class situation.

Hypothesis II: The self-directed Ss will have an achievement level greater than that of the controls in certain peripheral areas such as language arts and work-study skills. (Rejected)

In language arts achievement, as can be seen in Table 6 and Table 7, it is readily apparent that there were no significant statistical differences between the E and C groups in any of the areas, although in Mechanics of English the direction generally favors the Es whereas in Spelling the direction generally favors the Cs.

One interesting phenomenon occurred when all Listening scores for both groups decreased during the second testing. The investigator can offer no explanation for this occurrence except to hypothesize that the second form proved to be the more difficult one or that alternate form reliability was low. The technical report (Cooperative Test Division, 1957 b) indicates that no correlations were made between scores on alternate forms during the norms program. It is therefore quite conceivable that the internal consistency value of .93 for form 4A, the first of the two forms used in this investigation, does not reflect the reliability that might be expected.

The essay test was scored along the guide lines suggested in the manual. It was graded by two judges who were not aware of the classification of any of the Ss. Although the tendency is for gains to favor the E groups, no differences were statistically significant.

Table 6

Group Changes in Language Arts Achievement as Evidenced by Differences in Mean Gain Scores on the California Achievement Test

Variable	Group	N	Group	N	X Change Over Time E	C	t
Mechanics of English	Total E	39	Total C	47	11.97	9.65	.88
	4E	13	4C	15	21.38	14.60	1.21
	5E	16	5C	16	8.75	10.00	.36
	6E	10	6C	16	4.90	4.69	.07
Spelling	Total E	39	Total C	47	.26	1.19	.97
	4E	13	4C	15	.46	.67	.12
	5E	16	5C	16	.56	2.44	.97
	6E	10	6C	16	-.50	.44	.80
Total Language	Total E	39	Total C	47	12.26	11.36	.28
	4E	13	4C	15	21.92	15.27	.99
	5E	16	5C	16	9.31	11.69	.50
	6E	10	6C	16	4.40	7.38	.70

The one area in which group changes occurred in favor of the Es to such a degree that it must be interpreted as a reflection of the resource room was in Arithmetic Reasoning on the California Achievement Test. The total E group obtained mean gain scores significantly greater than those obtained by the total C group. The difference proved to be significant at the .01 level. Table 8 includes these data. The fourth grade Es gained significantly more

Table 7

Group Changes in Language Skills as Evidenced by Differences in Mean Gain Scores on the Sequential Tests of Educational Progress

Variable	Group	N	Group	N	$\bar{X}$ Change Over Time E	C	t
Listening	Total E	38	Total C	47	-6.58	-7.47	.50
	4E	12	4C	15	-4.75	-4.67	.02
	5E	16	5C	16	-8.94	-10.12	.42
	6E	10	6C	16	-5.00	-7.44	.92
Writing	Total E	38	Total C	47	8.84	5.34	1.18
	4E	12	4C	15	2.17	4.40	.44
	5E	16	5C	16	14.19	4.19	1.67
	6E	10	6C	16	8.30	7.38	.32
Essay	Total E	39	Total C	47	5.90	2.49	1.26
	4E	13	4C	15	6.85	3.13	1.05
	5E	16	5C	16	-.50	-1.44	.22
	6E	10	6C	16	14.90	5.81	1.65

than the fourth grade Cs ($p<.01$); the sixth grade Es gained significantly more than the sixth grade Cs ($p<.05$). It is reasonable to assume that the activities within the resource room might have been such that the children were self-trained to handle various aspects of problem solving and were able to make a ready transfer from non-arithmetic activities in the resource room to arithmetic reasoning in the classroom. Of course, this is only one interpretation. There are undoubtedly others that should be considered.

Table 8

Group Changes in Arithmetic Achievement as Evidenced by Differences in Mean Gain Scores on the California Achievement Test and the Sequential Tests of Educational Progress

Variable	Group	N	Group	N	$\bar{X}$ Change Over Time E	C	t
CAT Arithmetic Reasoning	Total E	39	Total C	47	4.23	2.02	3.11**
	4E	13	4C	15	5.31	2.73	2.66**
	5E	16	5C	16	3.44	2.06	1.12
	6E	10	6C	16	4.10	1.31	1.86*
CAT Arithmetic Fundamentals	Total E	39	Total C	47	15.31	15.23	.04
	4E	13	4C	15	9.31	9.67	.11
	5E	16	5C	16	17.25	17.69	.12
	6E	10	6C	16	20.00	18.00	.70
CAT Total Arithmetic	Total E	39	Total C	47	19.56	17.38	.94
	4E	13	4C	15	14.62	12.40	.63
	5E	16	5C	16	20.75	19.75	.24
	6E	10	6C	16	24.10	19.69	1.21
STEP Mathematics	Total E	38	Total C	47	4.16	6.89	1.38
	4E	12	4C	15	2.50	8.07	1.41
	5E	16	5C	16	6.88	8.06	.34
	6E	10	6C	16	1.80	4.62	1.11

* Significant at the .05 level.
** Significant at the .01 level.

It should be noted, however, that the STEP Mathematics gains are not in favor of the Es. Indeed, the direction here would seem to favor the C groups.

Since it could be assumed that inclusion in the resource room could lead to deteriorated work habits and resultant lowered achievement in the regular room as well as the resource room, the investigator decided to check into possible differences in total academic achievement as reflected by the total score on the California Achievement Test. It is of course realized that certain measures on the California Achievement Test have already been discussed.

Table 9 includes the mean gain scores for the E and C groups. Here,

Table 9

Group Changes in Total Achievement as Evidenced by Differences in Mean Gain Scores on the California Achievement Test

Variable	Group	N	Group	N	$\bar{X}$ Change Over Time E	$\bar{X}$ Change Over Time C	t
Total Achievement	Total E	39	Total C	47	37.18	32.98	.92
	4E	13	4C	15	42.23	37.40	.45
	5E	16	5C	16	36.25	33.69	.41
	6E	10	6C	16	32.10	28.12	.65

also, there were no significant differences between the groups, yet in each instance the E Ss obtained higher mean gain scores then did the C Ss.

Although the Stanford Achievement Test: Social Studies, which includes a study skills section, is designed for administration to fifth and sixth grade children, it was considered feasible to administer this instrument to

all of the Ss in the present study. As can be noted from Table 10, the fourth grade and sixth grade mean gain scores were superior for the Es. The fifth grade mean gain scores were superior for the Cs. None of these differences, however, were statistically significant.

Table 10

Group Changes in Study Skills as Evidenced by Differences in Mean Gain Scores on Part B (Study Skills) of the Stanford Achievement Test: Social Studies

Variable	Group	N	Group	N	$\bar{X}$ Change Over Time E	C	t
Study Skills	Total E	39	Total C	47	4.10	3.55	.64
	4E	13	4C	15	6.08	4.87	.78
	5E	16	5C	16	2.88	4.12	.87
	6E	10	6C	16	3.50	1.75	1.37

Hypothesis III: The self-directed Ss will have significantly greater growth in the area of divergent thinking as evidenced by increased flexibility, fluency, and originality. (Rejected)

The Minnesota Tests of Creative Thinking: Abbreviated Form VII was used to assess divergent thinking changes over time. A non-verbal fluency score was obtained by an empirical count of responses on Task II: Circles. A verbal fluency score was obtained by a count of all responses included by Ss in Task III: Product Improvement and Task IV: Unusual Uses--Tin Cans. Non-verbal flexibility was not investigated. The verbal flexibility score was based on the number of times the S changed his approach in presenting responses for Tasks III and IV. Both the non-verbal and verbal originality

scores were obtained by summing the scores assigned by three independent judges. The judges employed a seven point scale with a value of one representing a very inferior response and a value of seven, a very superior response. Therefore, scores on originality could range from three to twenty-one. Although inter-judge reliability was not investigated, a perusal of the judges scoring showed a remarkable similarity.

Hypothesis III was rejected since there were no appreciable differences between the growth made by E groups and the growth made by the C groups. Table 11 presents the group changes in divergent thinking. As can be noted, the only significant difference was in the area of non-verbal fluency where the mean change for the sixth grade Es was significantly greater than the mean change for the sixth grade Cs ($p < .05$). Apparently a minor increase in the mean E score and a minor decrease in the mean C score, between September and February testings caused this difference. Since this is the only significant difference in 20 instances, it is reasonable to assume that this could have happened by chance alone.

Hypothesis IV: The self-directed Ss will have a level of growth in personal and social adjustment equal to or greater than that of the control group. (Accepted with reservations)

Two instruments were used to assess group changes in personal and social adjustment. The California Test of Personality and the SRA Junior Inventory were employed to determine the degree of change. Although the SRA Junior Inventory was not designed for this purpose, it was assumed by the investigator that any striking differences could be picked up by comparing the scores obtained by E and C Ss.

Table 11

Group Changes in Divergent Thinking as Evidenced by Differences in Mean Gain Scores on the Minnesota Tests of Creative Thinking: Abbreviated Form VII

Variable	Group	N	Group	N	X Change Over Time E	C	t
Non-verbal fluency	Total E	39	Total C	47	1.15	.28	.81
	4E	13	4C	15	3.15	1.20	1.18
	5E	16	5C	16	-.75	2.06	1.65
	6E	10	6C	16	1.60	-2.38	1.91*
Verbal fluency	Total E	39	Total C	47	6.21	7.79	.59
	4E	13	4C	15	9.92	14.20	1.20
	5E	16	5C	16	9.31	10.62	.26
	6E	10	6C	16	-3.60	-1.06	.90
Verbal flexibility	Total E	39	Total C	47	3.38	4.00	.37
	4E	13	4C	15	5.38	7.13	.72
	5E	16	5C	16	5.75	6.00	.09
	6E	10	6C	16	-3.00	-.94	.89
Non-verbal originality	Total E	39	Total C	47	-.10	.23	.28
	4E	13	4C	15	2.54	2.87	.19
	5E	16	5C	16	-2.19	-1.12	.51
	6E	10	6C	16	-.20	-.88	.33
Verbal originality	Total E	39	Total C	47	1.74	1.57	.15
	4E	13	4C	15	.31	.73	.23
	5E	16	5C	16	3.88	5.31	.91
	6E	10	6C	16	.20	-1.38	.72

* Significant at the .05 level.

In general, the 4th grade E group showed a significant gain in personal adjustment whereas the 6th grade C group made significant gains over the 6th grade Es in social adjustment. The total adjustment on the California Test of Personality reflected this also with the 4th grade Es showing a greater and more significant gain than the 4th grade Cs. The 6th grade Cs here also showed a more significant gain than the 6th grade Es. Table 12 presents the group change data on the California Test of Personality.

The SRA Junior Inventory scores must be interpreted in a fashion contrary to the interpretation of scores on the California Test of Personality. In general, the higher the score on the Junior Inventory, the more poorly adjusted the individual. The 4th grade E group lost significantly more points than the 4th grade C group which would indicate an improved adjustment for the 4th grade Es. In one instance this loss was significant. This occurred in the variable entitled About Myself. Table 13 describes the group changes on the SRA Junior Inventory.

Since there was an obvious discrepancy between the 4th grade and the 6th grade groups, it was reasonable to ask why such differences appeared. A questionnaire (see appendix A) was distributed to the children in the E groups. In light of their remarks it seemed plausible that the Ss' perceptions of the influences around them, i.e., adult reaction to the resource room program, led to many of the changes in personal and social adjustment. Although the majority of 4th grade students perceived that the classroom teacher did not care for the resource situation, they obviously felt support in that they believed that their parents were in favor of the program.

In the 5th grade the children perceived the classroom teacher's attitude toward the resource room in different ways. One child said that

Table 12

Group Changes in Personal and Social Adjustment as Evidenced by Differences in Mean Gain Scores on the California Test of Personality

Variable	Group	N	Group	N	$\bar{X}$ Change Over Time E	C	t
Personal Adjustment	Total E	38	Total C	47	.11	-.62	.35
	4E	13	4C	15	1.31	-4.00	2.22*
	5E	16	5C	16	-1.38	-2.06	.16
	6E	9	6C	16	1.00	4.00	.88
Social Adjustment	Total E	38	Total C	47	-.05	1.40	.77
	4E	13	4C	15	-.08	-3.60	1.10
	5E	16	5C	16	.00	1.69	.50
	6E	9	6C	16	-.11	5.81	2.19*
Total Adjustment	Total E	38	Total C	47	.21	.79	.17
	4E	13	4C	15	1.69	-7.60	2.02*
	5E	16	5C	16	-1.38	-.38	.15
	6E	9	6C	16	.89	9.81	1.74*

* Significant at $\leq$ .05 level.

he thought the classroom teacher "thought it was nice". Another said the classroom teacher "hates it". Most of the 5th graders considered their parents' attitudes fairly moderate as far as the resource room was concerned.

In the 6th grade all the experimental Ss except one perceived that the classroom teacher was opposed to the resource room situation. Typical comments were "(she) disliked (it) because (the) class was split up", "she

Table 13

Group Changes in Personal and Social Adjustment as Evidenced by Differences in Mean Gain Scores on the SRA Junior Inventory

Variable	Group	N	Group	N	$\bar{X}$ Change Over Time E	C	t
About Me and My School	Total E	39	Total C	47	-3.79	-2.15	.62
	4E	13	4C	15	-3.08	-.67	.46
	5E	16	5C	16	-5.12	-4.94	.04
	6E	10	6C	16	-2.60	-.75	.53
About Me and My Home	Total E	39	Total C	47	-1.38	-.79	.51
	4E	13	4C	15	-3.23	-.07	1.44
	5E	16	5C	16	-1.62	-.94	.33
	6E	10	6C	16	1.40	-1.31	1.64
About Myself	Total E	39	Total C	47	-1.46	.09	.63
	4E	13	4C	15	-8.38	-.13	1.78*
	5E	16	5C	16	3.94	-1.19	1.30
	6E	10	6C	16	-1.10	1.56	.71
Getting Along With Other People	Total E	39	Total C	47	-4.26	-2.62	.71
	4E	13	4C	15	-8.38	-4.07	.98
	5E	16	5C	16	-4.69	-3.00	.44
	6E	10	6C	16	1.80	-.88	.76
Things in General	Total E	39	Total C	47	-2.62	-2.32	.14
	4E	13	4C	15	-6.15	-4.87	.34
	5E	16	5C	16	-2.94	-.62	.68
	6E	10	6C	16	2.50	-1.62	1.17

* Significant at the .05 level.

didn't like it, she kept on saying that we had bad study habits and that the resource room was terrible for us. She was prejudice (sic) against us", "she didn't like it very much, I can tell by her ways," and "she thought we would not be ready for 7th grade and that we did not get enough homework."

In light of the above interpretations on the part of the children concerning teacher and parent attitudes towards the program, both the California Test of Personality and SRA Junior Inventory score changes seem quite reasonable. Where the parents and teacher could accept the program or at least appear neutral, there apparently were no great problems for the children. Where the children felt that pressures were being lodged against their activities, their social adjustment deteriorated as evidenced by the scores on the tests.

Implications for Future Research

Because of the presence of problems peculiar to this particular investigation, it seems evident that a replication of the present study would be in order. A few basic changes would be necessary, however. In the questionnaires completed by the children in the E groups, certain comments by them indicate what some of those changes should be.

Primarily the 4th grade children were unhappy about the destruction of some of their materials by some of the 5th and 6th graders. (It should be remembered that the resource room was a shared facility.) The 5th and 6th grade children objected to a lack of privacy during those times that they wished to study independently. In his zeal to allow the Ss in the E groups to interact with each other, the investigator failed to allow for those individuals who prefer privacy to group interaction. Isolation booths or carrels should be included in planning any future replication of the present study.

It is evident, also, that all individuals--parents, teachers, administrators, and children--should know and understand from the outset the exact purpose and nature of the resource room activities. A thorough understanding of the project should prevent a recurrence of the problems that befell the present study.

For the most part, the materials used in the resource room were quite appropriate. The children's comments on the questionnaires would tend to support this point. Indeed the Ss did not find any of the items within the resource room inappropriate, although they did have definite preferences. However, more and varied books, film strips, and other materials would be necessary since on occasion the absence of a more complete book and film strip library was felt. Most of the educational materials employed in the resource room had not been designed for children to handle without prior instruction from an adult. A redesigning of some basics, such as the reading kits and the science kits, would be necessary in order to obtain more value from them.

In addition to cleaning up a program in order to replicate the present study, other implications for future research make themselves evident to the investigator. Variations on the same approach would seem logical. Regular teachers might be employed as resource persons but in order not to change the intent of the present study, they would have to be instructed to refrain from initiating activities. It might be that education for the gifted should be a small group endeavor located in a large group facility. The teachers would have to be reminded that the entire group would only rarely, if ever, be taught at the same time. Whereas the present study didn't use resource people with particular content strength, it is conceivable that resource persons with

such strengths might be employed in the future. Two or three working together in a large resource room, or serving on a rotating basis in a smaller one, would be another way of approaching the present problem.

Another modification would be an investigation into different sub-groups of children that could benefit from resource room situations. Very young children's learning under this approach should be investigated. Perhaps, also, an IQ identification is not the single most important criterion in screening children into the program. Indeed, it is likely that some personality variables would indicate the type of individual who could most benefit from a fairly unstructured educational approach. Other sub-groups of children with differing intellectual capacities should also be investigated.

Another question could only be answered by a longitutinal approach to the present investigation: do certain advantages (as well as disadvantages) accrue to children over a period of two, three, or more years, that would not be evident at the conclusion of a one year study?

Finally, a study should be made into resource room learning of all content areas. It is possible that such subjects as arithmetic would not be mastered in an unstructured situation.

Summary

The present study was an attempt to investigate the effects of self-directed learning on gifted elementary school children who worked without teacher-imposed direction in a resource room.

The *Ss* were drawn from a population of 4th, 5th, and 6th grade children in attendance at an elementary school serving an upper middle class community. The 96 children considered to be moderately superior and above on various

intellectual measures became a pool from which E and C Ss were drawn randomly. Due to attrition, the original 48 E children were reduced in number to 39. The C groups remained intact. The mean Total IQ on the short form of the California Test of Mental Maturity was 126.6 for the total E group. It was 125.4 for the total C group.

A pre-test (September) and two post-test (February and June) administrations of several group devices were originally planned to measure all Ss' growth in academic achievement, study skills, divergent thinking, and personal and social adjustment. The instruments used to measure the Ss' growth in these areas were the California Achievement Test, the Sequential Tests of Educational Progress, the California Tests in Social and Related Sciences, the Stanford Achievement Test: Social Studies, the Minnesota Tests of Creative Thinking: Abbreviated Form VII, the SRA Junior Inventory, and the California Test of Personality. Since this study was terminated prior to the final testing, only the first series of post-tests were administered.

Other information was gathered through daily logs maintained by the resource room personnel, who also helped the E Ss establish and maintain patterns of behavior necessary for the most efficient and cooperative use of the resource room. These resource people were instructed to refrain from initiating activities or imposing direction upon the Ss.

Each sub-group of Es spent two periods per day in the resource room which housed a wide variety of books and materials. While here, members of the E groups had opportunity to explore areas of interest to them in reading, social studies, and science in the manner and to the depth they chose.

A series of t tests were run to determine if there were significant

statistical differences between the changes made by the E and C groups in the several areas under investigation.

Hypothesis I states: The self-directed Ss will have a level of achievement greater than that of the control group in the areas of reading, social studies, and science. Since there was no clear cut trend favoring the Es based on significant statistical differences between groups, this hypothesis was rejected. This indicates that in those academic areas under investigation there was generally no difference in growth in achievement between those Ss taught by teachers and those Ss who directed their own activities.

Hypothesis II states: The self-directed Ss will have an achievement level greater than that of the controls in certain peripheral areas such as language arts and work-study skills. This hypothesis was rejected, again indicating no clear cut advantage for either group except in Arithmetic Reasoning on the California Achievement Test. This gain favored the E groups. The investigator speculated that the freedom inherent within the resource room situation might have enabled the Es to develop non-arithmetic problem-solving skills which had transference to the regular classroom situation.

Hypothesis III states: The self-directed Ss will have significantly greater growth in the area of divergent thinking as evidenced by increased flexibility, fluency, and originality. Since the E groups' gains were not significantly superior to the C groups', this hypothesis was rejected.

Hypothesis IV states: The self-directed Ss will have a level of growth in personal and social adjustment equal to or greater than that of the control group. This hypothesis was accepted with certain reservations since it appeared that the resource room in and of itself did not lead to poor adjustment on the part of the Es. Where the children perceived adult support (or at

least neutrality) towards the program, the mean adjustment scores showed a positive change. Grade 4 Es' growth supported this point. Where the children perceived adult sanctions raised against the resource room and its activities, adjustment scores fell. This was evident for the 6th grade Es.

In conclusion, there were very few significant statistical differences between E and C groups in academic achievement in the resource room activities (reading, social studies, and science). There was also little difference between gains made by the Es and the Cs in the other academic areas, study skills, and divergent thinking ability. Personal and social adjustment seemed to be most affected by adult opinion of the program.

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APPENDICES

APPENDIX A

QUESTIONNAIRE FORMS COMPLETED

BY RESOURCE ROOM PUPILS

AND THEIR PARENTS

Student's Report Form

Boy_____ Girl_____ Grade_____

1. If it were up to you, would you like to continue working in the resource room? Yes_____ No_____

2. Would you like to spend more time, less time, or the same amount of time in the resource room?

   More_____ Less_____ Same_____

3. What were some of the best things that happened to you while you were in the resource room? What things did you enjoy the most?

   _____

   _____

   _____

   _____

   _____

   _____

4. What were some of the poorest things that happened to you while in the resource room? What things did you enjoy the least?

   _____

   _____

   _____

   _____

   _____

5. How do you think others felt about the resource room program?

   Mother_____

   _____

   Father_____

   _____

Sisters and brothers_____

_____

Classroom teacher_____

_____

Special teacher (music, art, etc.)_____

_____

Principal_____

_____

Resource room people_____

_____

6. Did you try to do the work your class was doing in reading? Yes_____ No_____; social studies? Yes_____ No_____; science? Yes_____ No_____

7. Did your teacher suggest that you do the regular work in reading? Yes_____ No_____; social studies? Yes_____ No_____; science? Yes_____ No_____

8. Other comments_____

_____

_____

_____

_____

Parent's Report Form

Sex of Child_____ Grade_____

1. In light of the evidence presented tonight, would you like to see your child continue in the resource room? Yes_____ No_____

   Statement:_____

2. What behavioral or attitudinal changes on your child's part have you noticed from September to date?

   Eating_____

   Sleeping_____

   Sib relationships_____

   Peer relationships_____

   Attitude towards school_____

   Attitude towards assigned school work_____

   Attitude towards self-determined school-related work_____

3. In the light of the different educational experiences your child has had in the past, including the activities within the resource room, what modifications, if any, would you suggest for future school curricula and teaching methods?

4. Have you encouraged your child to do the regularly assigned work of the control group in reading? Yes_____ No_____ Sometimes_____

Social studies? Yes_____ No_____ Sometimes_____

Science? Yes_____ No_____ Sometimes_____

Statement:_____

5. General Comment:_____

APPENDIX B

SAMPLE DAILY LOG MATERIAL

The following pages are for all practical purposes almost exact replications of five different daily logs kept by four of the resource room persons. In order to retain the spirit of the originals, very little was done in the way of editing. The names of Ss, of course, have been disguised.

The reader should note that the five entries have been taken from the five different months of the program's operation. It should also be noted that only the morning sessions are represented by the entries.

OCTOBER 9, 1964: AM

Grade 4 - The children busied themselves immediately. Sal at typewriter. Pat and Tho at teaching machine. Mar at microscope. Joy, Deb, Jan and Dar gossiped and whispered (I think about each other). Sal at films. Ric, Wal and Dea guessed places on map. Jac worked alone. There's a group around the microscope. They turned off the light over it to see it better (Dea, Tho, Mar). Ric and Wal still at map--they haven't moved in 35 minutes. Group is getting bigger at microscope. Mar the leader. Mar reserved the microscope for this afternoon--asked me to order more slides for it.

Grade 5 - Children rushed in and busied themselves enthusiastically. Sal at doorbell with Tom. Lis, Mai, Lor and Nan reading. Jef demonstrating movie about girl doing twist to Mic. Sco and Arn at new science table. Tom, Bil, Geo, Lau, Jef--all burning candles. Mic and Tom at teaching machine. Mel worked alone at typewriter for 30 minutes. Then she brought her report on Italy, written longhand, for me to read. Nan, Lis, Mai and Lor still reading or making posters at same group of desks. Mel working alone at separate desk. Boys at science table using all the candles. They've burned continually since the period started. Need more candles. They were horsing around and too messy. I told them to start cleaning up--no response. Threatened to withdraw privilege of science kit to all of them if mess wasn't cleaned up by 10:25. They're working on it now. Lau burned his hand and dropped a tube into the sink. It broke. Lau, Sco, Arn and Tom stayed until 10:35 cleaning the equipment. The area looks very nice and they worked very hard. They left only when the others arrived.

Grade 6 - No one went to the science table. This group is so silent. Each is working absorbedly. Deb B. and Deb H. have gone to kit and have the book out for experiment. Ste and Deb are taking RFU tests. Mar came in late--explained

she had to talk to her teacher. Eri asked me, "If you don't like the resource room, can you go back to your regular classroom?" I told him I'd talk to Dr. Gold and let him know Tuesday. Mar overheard and said, "Why wouldn't anyone like the resource room?" I said I didn't know. She said, "Unless it's because there's not enough work." I said what did she want to do. She said, "Nothing-I don't know, the other group is loaded down with homework and I'm terribly jealous--not jealous really, but I just want to do more work so I can pass and enter seventh grade a little better prepared." Then she walked away and is now doing her NFU tests. They are very important to her. Everyone else still working quietly. Deb B. and Deb E. doing experiments with magnet. Three of the boys are not working. One is sleeping and two are just sitting with open books talking. They seem bored. Mar said she can't concentrate because everyone is talking, although the group is very quiet. I suggested she move a desk to the corner of the room by the window and she is doing this. No one is at the Kit or the Tinkertoys. Several of the girls are talking--half-way absorbed in books or reports on books. Ste and Dia are teasing each other and gossiping, laughing, etc. One of the boys is reading a textbook.

NOVEMBER 23, 1964: AM

Grade 4 - The children came in eagerly. Most of them look first at the new film strips. Then Mar, Arn and Ric start working on the papier-mache. They squeeze out the water, get some paste and start adding to it. Arn wasn't very happy because I was only able to get one new filmstrip on the Congo. The three Musketeers call over Tho to ask his opinion about the papier-mache and how much glue. Then Tho goes back to his corner. Dav is sitting next to Tho and they have been chatting. Tho is printing a description of the heart and how it works. He has ruled lines on a big sheet of paper and marked equal spaces for his

letters and now he is printing in a modified block form. Dav is now putting in the states on the map of the United States he drew freehand on Friday. He is having a few troubles with the proportions of the states. Tho and he discuss this. Now Tho goes to the dictionary to find out how to divide contract into syllables. Dav goes to type and I ask him to put tape on the keys. He does this in about five minutes and then starts typing very slowly and making faces. Jam is working on an RFU test. She was making a chart of horses. Dar and Jac have been working on their horse charts at the back counter and discussing the plastic horses. The custodian brings in the map so Car, Jac, Tho, Sus and Arn start a teaching game. One stands in front of the map facing the group and the others call out city and states which the one must point to, at least generally, without looking. Wal has been tracing a map of United States, and looking at film strips of the Congo. The principal came in to talk to boys about papier-mache and watched group at the map. Guess she couldn't complain. Boys got wood for base of volcano from custodian at her suggestion. Joe came in during period with reading accelerator. Sal worked most of the period on a reading test, RFU I think, and then joined map group. She was busy all period.

Grade 5 - Dan goes to typewriter. Principal comes in and says she warned him. He takes tape off keys and objects to putting it back on. It's not too effective and they can peek and see through so I just keep after him to use the touch system and he sits there doing one exercise. Pau is projecting slides onto paper on the board with his usual self-contained air. Lor, Lis and Nan are looking at an African film strip together. Emi is reading Enchanted Isles and has been absorbed in it all period. Lis drew a free hand outline of Spain for Mik and now he is putting in cities. Sco is working on a cross word puzzle in his News Time. Arn, Don, and Tho are using the opaque projector again to

trace a map of New York State. When I ask Don what they are going to do after they trace it, he mumbles something about making a report but he isn't very definite. Mel gives a very nice report on Italy. Mik gives a short report on Hawaii. Then Mik C. gives a report on Spain and doesn't read it--some things he can just talk about. Bil has been reading "Touchdown Pass" all period. Goes to typewriter when Dan leaves it but gives up because the tape is back on the keys. Sco starts typing, then Pau. Mik E. is giving Mik C. the HFU grading test. Jef was doing an experiment all period with water, tubing and iron filings. Lar seemed to help him some. Lis, Lor, Nan and Emi spent last 20 minutes at the board. Played word games with social studies words.

Grade 6 - Deb. E. gives a report on Chile. Ste at the typewriter, grumbling about the type. He and Gus grabbed "South America" and are working together. How is still grumbling about the resource room while he reads about Switzerland. Mar reading "Nine Planets" and making comments to How. Mik sitting right next to them and reading with great concentration. I compliment Ste on his exhibit on Brazil and he says he thinks it's "yukky" so I ask him why and he says just because. He and Gus are still working on it. Ste throws out his pan of red water and paper towels and finds a nail rusted when left in there. Deb is practicing the touch system. Dan works on her do-it-yourself circle on South America and Chile for the cyclo-teacher. Earlier she asked me why I wrote down what they were doing. I said Dr. Gold wants to know what they are doing. She says her mother asks her every night what the children are doing and what she has done. She knows she doesn't have to do the same things but she seemed a little uneasy. Mar and How complain about the noise in the room but they have been talking and bumping their desks all period. Ste finds a balloon and lets it go. He says he is doing an experiment. Then he puts a little water in it and lets it go again. How and Mar are amused and then the whole class. Ste and Dia are tracing horses in the World Book and talking together and with Deb when she stops typing.

December 11, 1964 DECEMBER 11, 1964: AM

Grade 4 - Group came in quietly and got busy. Mar absent. When I asked Pat if he was absent she said, "Yes, you can tell the difference." And you certainly can. Ric, Wal, Dav and Kar listening to record turned low. Sus writing states with population on board. Sal using Tinker Toys. Jac and Dar reading. Tho working in Explorer 1965 pamphlet by himself in corner. Arn wandering around moving from one interest area to another. Looks at maps, charts, posters, and stops to comment on what each group is doing. Now arguing quietly about state abbreviations that Jam[illegible] and Sus[illegible] are working with. Pat behind me. Reading Criss-cross Shadow--"Hardy Boys Mystery", she said. Group at record player listened to Triumphal March by Verdi. Now William Tell Overture. Wal and Tho quizzing each other on Explorer. Now observing Sal still at Tinker Toys. Sal went to group at records. She and Wal listening. Arn observing. Sal going from group to group observing. Not commenting. Jac reading "Blood Brothers", Car reading "Wizard of Oz". They interrupt their reading to chat a minute but return shortly. Sal wrote alphabet on board and counted off every fifth letter with a circle. Now is washing board. Pat thinking up definitions and writing on board. Sus and Jam still working with states from book "States". Arn listening to record with earphones--jazz. Kar pretending to hypnotize Tho with swinging locket. Sal going over and over the board with wet sponge--won't let anyone use it. Jam and Sus thinking up different ways to guess states. Holding up objects for hints, testing their spelling, etc. Kar, Tho, Pat, Sal, Sus, Jam standing at door ready to go five minutes early.

Grade 5 - Dan went straight to corner of room and sat down to read. Bil walked around and annoyed a few people, then joined him. Not too horsey yet. Jeff using earphones and listening to Arabian Nights. Paul is using enlarger. Lis

and Nan doing SRA tests. Sco and Arn asked permission to work at Science cart with tubing, fountain and Tinker Toy windmill. Emi and Mel drawing picture quizzes on board. I separated Bil and Dan. Dan helping Pau at enlarger. Pau is the planner, I think. Lor doing science kit tests. Emi and Mel at record player. Mik C and Mik E drawing cartoon characters and animals. They're very good. I questioned legitimacy and they argued that cartooning was scientific. They've been reading about it in encyclopedia. Nan and Lis doing quizzes on board (original) on classics (Rumpelstilskin, etc.).

Grade 6 - Steve reading Mad comic--made him stop. Now doing poster on stereo sound with Gus. How helping Mar make a crystal radio set from parts Mar has collected at home. Lau sitting alone doing outline of book on Japan. Mik reading "Man High," then going to read Jules Verne's Adventures in Paradise. Group talked several minutes trying to decide how to apir off for project. Have decided--Deb doing Switzerland, Dan doing Italy. Dia and Ste writing on Pyrenees Mts. Mik watching Mar and How scrape insulation off copper wire for radio.

January 18, 1965 JANUARY 18, 1965: AM

Grade 4 - Jam and Sal sat at typewriter and it doesn't work. Mar, Ric and Sal tried to fix it but no luck. I can't seem to figure out what's wrong. Had a terrific volcano demonstration just now. It had pieces of sparkler in it. I made all the children stand 4 to 5 feet away. Very impressive. They opened all the windows to air out the room--we're freezing. Kar and Jac looking at films. Mar got mop and cleaned up floor from vohano. Wal reading quietly. Jam and Sus doing word games on board - Tho, too. Pat is starting some kind of project. Dav studying eye-ball (plastic) Tho brought in. Arn, Ric and Mar are looking at it too. Dan reading, Sal at typewriter (Dav fixed it). Boys have decided to do chart on the eye. Sue, Tho and Jam are doing diagram on board of sun and earth.

Grade 5 - Gus reading. Tom, Ann and Pam looking at slides. Ior at record player and Hai at typewriter. Mik C. at cyclo-teacher. Don on SRA Science book. Mel just sitting quietly. Jef reading. Lis and Han reserving slide projector for afternoon. Mel watching Hai at typewriter. Sam doing SRA science tests too. Mik E. reading. Everyone is busy. Pam listening to percussion records now--I'm going to get new records for them this meantime. Mik C. and Bil and Lou still at cyclo-teacher. Mel finally out of chair and is measuring string on board. Jef and Hai are working together on SRA reading. Now they're at the dictionary. Ann reading now - everyone busy. Mel is very quiet today--she seems sad. Han and Lis gave me their reading lab books to keep because they've finished them. Everyone is gabby now. Boys discussing blood.

Grade 6 - Girls settled right down. Han and Dia on SRA reading labs. They told me I was elected the best resource room teacher--I told them that was because I hadn't been here as long as the others. Mik at typewriter, Ste just fooling around. Now they're experimenting with tacks on the bottom of their shoes. They rub their shoes across the floor to see how hot they get. Mar reading "John Kennedy, War Hero." Mik looking through SRA reading. All the girls are reading. Ste is drawing a TV and explaining the dials and parts. All talking about TV and other appliances. Talking about the air conditioners in their homes.- They have so many advantages that they just take for granted. Discussing air currents and effect of different temperatures on air. Gus looking through books for something new to read. Now he's listening to records.

February 16, 1965: AM FEBRUARY 16, 1965: AM

Before class the principal mentioned that they were having quite a few behavior problems and I should sit on them today and I said I would.

Grade 4 - Kar and Dar are making Norse drawings from the book of Norse legends they found. Sal is setting up to work at the typewriter. Tho and Wal are doing an experiment from "How and Why of Electricity." Sus, Jam, Wal, Arn and Ric are drawing on the board. Now Wal is reading "Our State" and Dav is typing. Ric is interested in making codes--now Arn is joining him. Pat started thinking about her parents coming up to school and started re-doing her dog book. Wal is expounding on the theme 'nobody knows everything about anything'. Sal is drawing an elaborate chart on the board about air. Sus and Kar and Jam are testing their geography on the cyclo-teacher. The group has been busy and industrious today.

Grade 5 - Children came in late--they have arithmetic to do. Jef has the weights, Pau is trying to fix wood to mount his telescope. Mel, Don and Mik are copying from the encyclopedias about heroes--Lindbergh, Garfield, etc. Tom is doing a crossword from Newstimes. Dan came in hitting and punching and so I made him sit down by himself (took 5 min.). Arn and Lar are reading an experiment book. Bil is reading Social Studies. Arn got a battery from the supply room. Lis and Nan are working on the states -- using the World Books. Lor is reading Newstimes. Mik E. is typing, Mik C. is reading the Life book on World War II. Dan has been trying to get up and every time I make him go back. He's getting pretty mad and it is too bad he must be handled this way. I've had to stop and 'yell' at him three times in 40 minutes. Arn and Sco are looking at film strips. Pau is building a Tinker Toy support for his telescope (which he brought from home). He wants to set up a display about star watching and constellations.

Grade 6 - Dan, Dia, and Ste studying countries. Lau reading and taking notes. Deb trying to choose country to study. Gus is looking through the prism. A current detector is being made by Gus and Mik. The sun is out and Dan and Dia are looking at the prism.

APPENDIX C

RESOURCE ROOM MATERIALS

Both purchased and borrowed materials were employed in the resource room. They included the following:

Reading

- SRA materials
  - Reading Laboratory (Elementary Edition)
  - Reading Laboratory III A
  - Reading for Understanding
  - Reading Accelerator Model IV
  - Pilot Library III B
  - Classroom Library II C
  - Whitman Classroom Bookshelf (Junior Series)
- Library books on loan
- Assorted film strips

Science

- SRA materials
  - Earth's Atmosphere Laboratory
  - Weather and Climate Laboratory
  - Measuring Length in Metric Units Kit
  - Matter and Atomic Structure Programmed Materials
- Science Kit
- Laboratory table and materials
- Library books on loan
- Assorted film strips

Social Studies

- Assortment of books
- Varied film strips
- Maps

General

World Book Encyclopedia

Webster's Third New International Unabridged Dictionary

Cyclo-teacher kit

Assorted film strips

Film strip viewers

Electric typewriter

Phonograph with head-set

Assorted phonograph records

Tinker toys

Overhead projector

Projecting microscope